

Tax Capacity Disparities and Fiscal Equalization: The Case of Spanish Local Governments*

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ABSTRACT: In the absence of an equalization grant system, like we justify occurs in Spain at the local level of government, those governments that bear a decrease in their level of tax capacity will have to adjust their budget either by increasing their level of tax effort, by reducing their level of public services and/or by incurring in a deficit. By means of a dynamic panel data analysis, and using a database from municipalities of the province of Barcelona (1993-99), we describe that process of fiscal adjustment. About a 25% of the shock is internalized through an increase in tax effort, a 35% through a reduction in public expenditure (mainly investment), while the rest (40%) is covered by an increase in the level of debt (i.e., the adjustment is delayed). However, this process of fiscal adjustment is very much influenced by the political situation of the municipality. Coalition and minority governments (“weak” governments) tend to delay the (unavoidable) fiscal adjustment, and a 70% of their shock is covered by an increase in the level of debt, while the rest of municipalities (“strong” governments) adjust immediately (80% reduction in public expenditure and 20% increase in tax effort). Leftist governments tend to react mostly through increases in tax effort, while rightist governments tend to reduce public expenditure to a greater extent. Finally, we find that municipalities tend to react differently in front of a negative (28%) and a positive (26%) shock with respect to the level of tax effort. Hence, municipalities are relatively reluctant to decrease taxes.

JEL Code: H61, H62, H71, H72

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* We would like to thank the participants in the ALPES Workshop “Reforms of local fiscal equalization in Europe”, 2002, Speyer (Germany), specially to P. Else, G. Gilbert, and A. Solé-Ollé for comments and suggestions, although the usual disclaimer applies. Financial support of 2001-SGR30 (Generalitat de Catalunya) and SEC2000-0876 (Ministerio de Ciencia y Tecnología) are gratefully acknowledged.

1. Introduction

How does a municipality react in front of a decrease in its level of tax capacity? Does the equalization grant system fully or partially compensate that loss of tax revenue? In the case the equalization grant system does not fully compensate it, does the process of fiscal adjustment carried out by the municipality depend on its political situation? These are the main questions that we will try to answer by means of an empirical analysis carried out from a unique database of municipalities of the province of Barcelona for the period 1993-99.

Obviously, if there exists an appropriately designed equalization grant system, that shock should be compensated by an increase in the amount of equalization transfer received by the municipality. This transfer should allow the municipality to provide a certain level of public provision, given a level of tax effort and independently of its level of tax capacity. For example, if the equalization grant system fully equalized those fiscal shocks, only as long as the municipality exerted a level tax effort above the standard fixed by the equalization grant it could provide a higher level of public services than the average of municipalities.

However, in Spain we will justify that such equalization grant system is not present. Therefore, permanent or temporary fluctuations in tax capacity must produce three kinds of effects on the fiscal decisions of a municipality:

- a) a reduction in the level of public good provision (its level of expenditure will be relatively smaller); and/or
- b) an increase in the level of tax effort; and/or
- c) an increase in the level of indebtedness, that is, incurring in a deficit.

Certainly, all these three hypotheses are not mutually exclusive, and for instance in front of a decrease in tax capacity a municipality might decide to reduce public expenditure, but also increase the amount of revenues at its disposal by exerting a higher level of tax effort and/or by incurring in a deficit.

In Spain, there are approximately 9.000 municipalities. Differences among them are acute: they differ in their size, in their geographical situation, in their income level, or in their tax capacity. In this paper we aim at analyzing their fiscal decisions in relation to this last variable, since this is the variable that we will identify as the source of an adverse fiscal shock. As can be seen from Table 1, the differences in tax capacity of the municipalities are significant¹. While some municipalities have an index of tax capacity above 2, others have an index below 0,6^{2,3}.

Table 1. Spanish municipalities' Tax Capacity. 1998

Municipality	Tax Capacity
<i>Top Tax Capacity</i>	
Sitges	2,133
Castellbisbal	2,103
Premià de Dalt	1,776
<i>Bottom Tax Capacity</i>	
Navas	0,601
Sant Joan de Vilatorrada	0,558
Santa Margarida de Montbui	0,431
Average	1
Standard deviation	0,324
Max-min	4,947

Source: Own elaboration from fiscal data of the province of Barcelona; *Sistema d'Informació Econòmica Municipal* (SIEM), Diputació de Barcelona.

Municipalities do not only differ in their level of tax capacity, but they also differ in

¹ The sample used contains 104 municipalities from Catalonia.

² The *index of tax capacity* has been calculated as a ratio: in the numerator, there appears the tax revenue that would have been obtained by a municipality applying the corresponding average tax rate to its tax bases, while in the denominator, there appears the revenue that would have been obtained in the case that the municipality had the average tax base and had also applied the average tax rate. Each amount of revenues has been summed up for the three most important municipal taxes: the property tax (*Impuesto sobre Bienes Inmuebles*, IBI), the vehicle tax (*Impuesto sobre los Vehículos de Tracción Mecánica*, IVTM) and the tax on businesses (*Impuesto sobre la Actividad Económica*, IAE). Analytically,

$$\left(\sum_{k=1}^3 (B_{it}^k \bar{t}_t^k / P_i) \right) / \left(\sum_{n=1}^n \sum_{k=1}^3 \bar{B}_t^k \bar{t}_t^k / \sum_{i=1}^n P_i \right)$$

where k reflects each one of the three taxes, B_{it}^k is the tax base of the k -tax for municipality i in the fiscal year t ; t_{it}^k and \bar{t}_t^k are the tax rate of municipality i and the average tax rate for year t , respectively; and P_i is the population of municipality i .

³ In our empirical analysis, we will not make a difference between permanent and transitory variations in the level of tax capacity of a municipality. Hence, for example, the differences in tax capacity shown in Table 1 might be due both to structural and transitory disparities among municipalities.

other aspects like the political context. Thus, in front of a fall in tax capacity, we would expect different reactions of the municipalities. For example, we would expect that those governing parties that do not hold a majority of seats in the City Council, and so need to form a coalition or to govern in minority, tend to delay the (unavoidable) fiscal adjustment (Alesina and Drazen, 1991). We would also expect that leftist governments do not react in the same way than rightist governments (Tavares, 1999). These and other hypotheses will be tested in the empirical analysis⁴.

According to our results, in front of a decrease in tax capacity, a reduction in public expenditure covers a 35% of the shock, a 25% is covered through an increase in taxes, while the rest of the shock (40%) is overcome through an increase in the level of debt. However, as expected the political situation of the municipality strongly conditions that process of adjustment. Those governments that hold a majority of parliamentary seats in the City Council carry out the necessary fiscal adjustment immediately, since their level of debt hardly increases and tend to reduce to a great extent the level of public expenditure (81%), while the rest of governments tend to delay the (unavoidable) adjustment, since they mostly use debt to neutralize the shock (62%). We also find differences between leftist and rightist governments, since the former tend to react much more by means of increases in taxes (30%) than the latter (18%). Finally, although it is not related with the political situation, we obtain that municipalities react differently with respect to the level of tax effort, depending on whether they face a positive or a negative shock in tax capacity. Thus, our results show a certain reluctance of the municipalities to decrease taxes in front of a positive shock, since in absolute values that reaction is smaller than in the case of a negative shock.

The structure of the rest of the paper is as follows: first, we describe the main grant of the Spanish municipalities (the so-called "Participación Municipal en los Tributos del Estado"); next, we set up the empirical framework of our analysis and present the main results. Section 4 concludes.

⁴ On these issues relating fiscal decisions and the political context, see the excellent reviews by Drazen (2000) and Persson and Tabellini (2000).

2. Equalization Grants in Spain: La Participación Municipal en los Tributos del Estado (PMTE).

2.1. *The Impact of Equalization Grants on the Budget*

Equalization grants try to avoid that in front of a fall in tax capacity the three aforementioned relations cited in the introduction hold (i.e., a reduction in the level of public services, and/or an increase in the level of tax effort and/or an increase in the level of debt). That is, it would be desirable that all municipalities were able to offer the same level of public services (not less) exerting the same tax effort and incurring in the same level of public deficit (principle of horizontal equity, Buchanan, 1950; or Auld and Eden, 1983)⁵. Both the theory of fiscal federalism and the international experience have shown that the principle of horizontal equity can be achieved if equalization grant systems are employed.

In order to check the impact of a equalization grant on the budget of a municipality, suppose the following budget constraint in the presence of a grant system that attempts to equalize tax capacity:

$$G = tB + \bar{t}(\bar{B} - B) = \bar{t}\bar{B} + (t - \bar{t})B \quad [1]$$

where G is public expenditure, t is the tax rate set by the municipality and B is its tax base, while the parameters regarding the equalization grant system are \bar{t} , a standard tax rate, and \bar{B} , a standard tax base⁶. On the one hand, the *level* of expenditure of a municipality will be a constant or a standard level of expenditure, $\bar{t}\bar{B}$, as long as the municipality exerts a tax effort equal to the standard tax rate ($t = \bar{t}$). Otherwise, it will provide a level above (below) the standard if it exerts a level of tax effort above (below) the standard, $t > \bar{t}$ ($t < \bar{t}$). On the other hand, in front of a fall in tax capacity, and maintaining unchanged the level of tax effort and supposing that it is not possible to

⁵ The literature has also identified efficiency reasons to justify the establishment of equalization grants. See Boadway and Flatters (1982) and Boadway and Hobson (1993).

⁶ Expression [1] could be modified if we considered the possibility that the equalization grant system does not fully equalize the deficit in tax capacity, but only a certain percentage, α . In that case, the standard tax rate should appear multiplied by α .

incur in a deficit, the *reaction* of the municipality with respect to public expenditure will have to be the following:

$$-\frac{\partial G}{\partial B} = -(t - \bar{t}) \quad [2]$$

In the absence of an equalization grant system ($\bar{t} = 0$), public expenditure will decrease in t , while being an equalization grant system at work means that public expenditure will remain constant if $t = \bar{t}$. That is, the equalization grant system guarantees that a municipality is immune to variations in its level of tax capacity as long as $t = \bar{t}$.

In the empirical analysis, our main aim will be to estimate the reaction expressed in [2], once we will have shown in the next section that the grant system in Spain does not equalize differences in tax capacity among municipalities. Nevertheless, recognizing that in front of a fall in tax capacity a municipality can simultaneously increase the level of tax effort and/or incur in a deficit (i.e., delaying the fiscal adjustment), we will also estimate the reaction of these two last (endogenous) variables with respect to a variation in tax capacity.

2.2. *Equalization Grants in Spain: La Participación Municipal en los Tributos del Estado (PMTE).*

In Spain, municipalities receive an unconditional grant from the central government, the so-called *Participación Municipal en los Tributos del Estado* (PMTE), which represents above the 25% of their non-financial revenues. If this grant really equalized the resources of municipalities, it would contribute to reach the principle of horizontal equity. This fact is what we aim at analyzing in this section.

Spanish municipalities receive 60,55% of their non-financial incomes through taxes, they receive above 35,8% through transfers from other administrations, and above 3,65% of municipalities' non-financial incomes are obtained from other sources (wealth income, or income from real investment).

A 87,7% of transfers are current. These are basically materialized in the aforementioned

Participación Municipal en los Tributos del Estado (PMTE). This is an unconditional grant, and is allocated among the municipalities using three variables: population, tax effort and number of classrooms⁷. To be precise, the formula used is the following⁸:

$$G_i = [0,70 \text{ Population} + 0,25 \text{ Tax Effort} + 0,05 \text{ Number of Classrooms}]Q \quad [3]$$

$$G_i = \left[\underbrace{0,7 \frac{P_i c_i}{\sum P_i c_i}}_{\text{Population}} + 0,25 \left[\underbrace{0,8 \frac{R_i^r}{R_i^p} + 0,2 \frac{t_i}{t_r} \frac{B_i}{B_r}}_{\text{Tax-Effort}} \right] \frac{P_i}{\sum P_i} + \underbrace{0,05 \frac{UE_i}{\sum UE_i}}_{\text{Number-Classrooms}} \right] Q \quad [4]$$

where:

G_i : grant coming from PMTE for the municipality i .

Q : amount of the grant.

P_i : population.

c_i : corrective coefficient (increase when increase municipality size; i.e., $c=1$ for the municipalities with a population below 5.000 inhabitants and $c=2,85$ for the municipalities with a population above 500.000 inhabitants).

R_i^r : real tax revenue.

G_i : potential tax revenue.

t_i : average tax rate of the Personal Income Tax in the municipality.

t_T : average tax rate of the Personal Income Tax in all the territory.

B_i : average tax base per capita of the Property Tax (*Impuesto sobre Bienes Inmuebles, IBI*) in the municipality.

B_T : average tax base per capita of the Property Tax (*IBI*) in all the territory.

⁷ Barcelona and Madrid do not take part from this allocation. Instead, they receive a fix amount that evolves using a discounting index.

⁸ Since 1999, another formula is employed, but as the sample used in the empirical analysis covers the period 1993 to 1999, expression [1] describes the formula applied during these years. Nowadays, variables and weighting used are: adjusted population (75%), tax effort (14%), inverse of revenue capacity (8,5%), and number of classrooms (2,5%). During the elaboration of this paper, a reform of the local financing system has been passed. This law introduces some changes in the allocation rules of this grant (which is now so-called "Fondo Complementario de Financiación"), which will be operative at the beginning of 2004. On the one hand, for those municipalities with less than 75.000 inhabitants, the allocation will be made in function of the level of population (75%), tax effort (12,5%) and tax capacity (12,5%). On the other hand, the rest of municipalities will receive a share in the personal income tax (1,6875%), in the VAT (1,7897%) and in the specific taxes (2,0454%).

UE_i : number of classrooms.

Table 2. Tax capacity, Equalization Grant (PMTE) and Population. 1998

Municipalities	Tax Capacity per/capita	Equalization grant per/capita	Population
<i>Less than 5.000 inhabitants</i>			
Callús	22.526	19.106	1.334
Castellví de la Marca	26.587	17.317	1.459
Cercs	47.406	20.936	1.483
<i>Between 5.001 and 20.000 inhabitants</i>			
Premià de Dalt	50.143	16.589	8.043
Montmeló	34.954	16.874	8.059
Corbera de Llobregat	32.386	13.454	8.246
<i>Between 20.001 and 50.000 inhabitants.</i>			
Vic	33.894	18.782	30.739
Igualada	32.495	19.855	32.526
Sant Adrià de Besos	33.491	21.044	32.830
<i>Between 50.001 and 100.000 inhabitants</i>			
Vilanova i Geltrú	38.246	19.686	50.244
Granollers	40.400	18.980	51.600
Viladecans	28.689	17.440	54.840
<i>More than 100.001 inhabitants.</i>			
Terrassa	34.571	20.690	165.654
Sabadell	23.507	22.730	184.859
Badalona	26.764	22.919	209.606

Source: Own elaboration from fiscal data of the province of Barcelona (see Table 1). Monetary amounts are expressed in current terms and in pesetas.

Therefore, the main variable used for the assignment of the grant is the population (indicator of needs). As can be checked from the formula, the variable tax effort is composed by two summands: the first one (which weight is 80%) rewards with a greater share of grant those municipalities that exert a greater tax effort (i.e., those municipalities that decide to exercise their tax autonomy setting higher statutory tax rates, which allows them to obtain a flow of tax revenue above what is considered as standard); the second one (which weight is 20%) rewards those municipalities that have a higher tax capacity (!). The second column in Table 2 shows the result of applying the

aforementioned formula for a sample of municipalities which includes municipalities with different size and with a different tax capacity. It is possible to observe that the grant per inhabitant is similar (for each interval of population) but it is independent of the municipalities' tax capacity.

As we have seen from Table 2, the equalization grant system in Spain (PMTE) does not contribute to the equity horizontal principle and so it is possible that the three effects aforementioned take place. That is, that those municipalities with a relatively low level of tax capacity have to exert a level of tax effort above the average, and/or to provide a level of public good provision below the average and/or to incur in relatively higher levels of public debt. In fact, Table 3 permits to observe the fulfillment of them: municipalities with a (relatively) higher level of tax capacity are able to provide a higher volume of public services without exerting a greater level of tax effort or getting into higher levels of debt. The econometric analysis of the next section will permit us to confirm us such preliminary result, once we have used the whole sample and have controlled for other variables that could also be affecting the fiscal setting decisions of a municipality.

Table 3 . Fiscal capacity, Current expenditure, Tax effort and Debt. 1998

	<i>Tax Capacity</i>	<i>I-Expenditure</i>	<i>Tax Effort</i>	<i>I-Debt/Resources</i>
Sitges	2,133	1,636	1,120	0,815
Castellbisbal	2,103	1,849	1,041	0,555
Premià de Dalt	1,776	1,258	1,315	0,622
Navas	0,601	0,728	0,920	0,779
Sant Joan de Vilatorrada	0,558	0,854	1,032	1,057
Santa Margarida de Montbui	0,431	0,628	1,155	0,948
Average	1	1	1	1
Standard deviation	0,319	0,231	0,168	0,319
Max-min	4,947	3,064	2,142	3,765

Source: See Table 1

3. Empirical analysis

3.1. *Basic empirical framework*

In the previous section, we have shown that the unconditional grant system in Spain does not equalize tax capacity among municipalities. That is, if a municipality bears a fall in its potential level of tax resources (or expenditure needs), it will have to adjust its budget by itself. Hence, under such a negative circumstance, the municipality will be forced either to decrease its level of public services, or to increase its level of tax effort, or to incur in a budget deficit (and so delaying the budgetary adjustment), or to carry out a combination of all that fiscal policies. Precisely, in this section, we aim at describing by means of an econometric analysis how the adjustment occurs, and whether this depends on the political situation of the municipality.

In order to fulfill this purpose, we will estimate three equations: one for the decision over the level of expenditure (differentiating between current and capital expenditure), one for the level of tax effort, and one for the variation in the level of debt (i.e., for the budget deficit). These will be the endogenous variables in our empirical analysis. Obviously, if there existed an equalization grant system, this should also be considered as an endogenous variable, since depending on its degree of equalization the grant would react to compensate any fall in the level of tax capacity of a municipality. However, as we have seen in section 2.2., in Spain this is not the case⁹.

Given that all the budgetary decisions are presumably simultaneously adopted, the set of fiscal decisions – current and capital expenditure, tax effort and deficit - could be estimated by means of a simultaneous equation system. However, instead of adopting that econometric strategy, we have decided to formulate and estimate a reduced form of each one of the three equations. This implies that each one of the equations will have to be specified with respect to all the exogenous variables of the model.

⁹ Certainly, the analysis of section 2.2. may be too simple to obtain a definitive conclusion about it. However, we also tried to incorporate the PMTE as an endogenous variable in our analysis to ascertain whether it compensates to a certain extent any fall in tax capacity, but the results were negative. That is, as expected the amount of PMTE allocated to a municipality appeared to be independent of its level of tax capacity, even after having controlled for other variables.

In order to set up the equations to be estimated, we initially adopt a very simple tax setting behavior – leaving aside among other issues those concerning tax competition (see, for a survey, Wilson, 1999) - in which the level of each component of the budget is chosen from the maximization of the welfare of a representative citizen (e.g., the "median voter"). Thus, according to this simple tax setting behavior, we should obtain that the optimally chosen level of each budgetary variable is such that the marginal benefit of public good provision (current and capital expenditure) equals the marginal cost of exerting a higher level of tax effort *and* the marginal cost of raising the level of public debt. Additionally, this relationship must respect the budget constraint. Therefore, the exogenous variables to be included in each one of the equations must be related with (i) the marginal benefit of public good provision; (ii) the marginal cost of exerting a higher level of tax effort; and (iii) the marginal cost of incurring in a budget deficit. The explanatory variables that have been included in order to attempt accounting for all these factors are the following:

- *Tax Capacity (TC)*: holding the level of tax effort unchanged, a greater level of tax capacity increases the amount of tax revenues. Nevertheless, as long as the marginal utility of local public goods is decreasing, we would expect a reduction in the level of tax effort (i.e., part of the increase in tax revenues is returned to the citizens), unless there exists fiscal illusion, or the marginal cost of public funds is decreasing in tax capacity (rich citizens are disposed to suffer from higher levels of tax effort and/or from higher increases in the level of debt, which obviously means higher taxes in the future). The lower the marginal utility of public goods, the greater should be the reduction in tax effort and/or in the level of debt and consequently the lower the increase in public expenditure.

Tax Capacity is the key variable in our empirical analysis. From it, we will be able to ascertain the effects that the absence of an equalization grant system have on the fiscal decisions of a municipality. Thus, the rest of explanatory variables included in the empirical analysis have to be considered as control variables.

- *Current grants (CG)*: we would expect the same sign than in the case of a variation in tax capacity, unless there exists fiscal illusion. In this latter situation (this is the so-called "flypaper effect"), we should observe a greater increase in public

expenditure than in the case of an increase of the same amount in tax revenues, and so a smaller reduction in the level of tax effort and/or in the variation of the level of debt (Courant et al., 1979; Oates, 1979).

- *Capital grants (KG)*: this type of conditional transfers might require that the recipient government co-funds part of the investment. Given this characteristic, the expected sign of this variable with respect to each component of the budget is ambiguous: if the capital grant does not need co-financing, we would expect a positive effect on expenditure, and/or negative on the level of tax effort and/or on the variation of the level of debt (that is, a greater amount of general resources, which were previously allocated to investment decisions, are now available either to expend, to reduce the level of tax effort and/or reduce the level of indebtedness). However, as long as the capital grant implies the need of co-funding, the estimate of capital expenditure should also be positive, but strictly greater than one, while the sign of the resource variables (tax effort and/or public deficit) should be positive.

- *Population (Pop), Density (Dens)*: the variable Population is commonly employed as an indicator of expenditure needs. However, given that the amount of the PMTE allocated to each municipality is basically calculated from the population share, and its weight is increasing in the amount of population (see previous section), the estimate of the variable Population could also be picking up the effect of this variable on the share of the PMTE. The squared of population has been introduced in order to control for the possibility of scale economies (see, for the Spanish case, Bosch and Solé-Ollé, 2002)¹⁰. The variable Density - number of inhabitants by km² - has been included in the econometric specification as another potential indicator of expenditure needs. Thus, the expected greater expenditure needs reflected by those two variables should force the municipalities to exert a higher level of tax effort and/or incurring in a deficit, unless the unconditional transfers (basically, the PMTE) have properly accounted for the cost impact of these factors in its formulation.

- *Income (Inc)*: this variable aims at picking up the preferences of each municipality -

¹⁰ In fact, in the empirical estimation, we have increased the degree of the polynomial function as long as the introduction of a higher degree was statistically accepted. Hence, as we will show, we have finally accepted the polynomial function of the variable "Population" to be of degree 4.

through the average income - with respect to public good provision. Thus, we would expect a non-negative sign of the estimate of this variable with respect to public expenditure. Then, if public goods are certainly normal goods, we should also obtain a positive sign of this estimate with respect to tax effort and/or to the variation in the level of public debt.

Although the fiscal setting behavior we have in mind is related with the welfare maximization of a representative agent, there is not doubt that (optimal) fiscal decisions are adopted within a diverse political context - i.e., these decisions might also be influenced by the existence of partisan preferences, an “electoral cycle” or might depend on whether the government is either “weak” (i.e., it governs in minority or by means of a coalition) or “strong” (it holds a majority of seats even without the need of forming a coalition)¹¹. In the next section, we broaden the set of (traditional) explanatory variables concerning fiscal decisions in order to take into account the potential impact of the political context.

3.2. *Political empirical framework*

The main hypotheses that will be tested concerning the political context are the following: leftist vs. rightist governments, electoral cycle, and weak vs. strong governments.

Leftist vs. Rightist Governments

According to the hypothesis of "partisan preferences", we should observe permanent differences in the *level* of the fiscal variables established by the municipalities according to their political color (see Hibbs, 1977; and the recent review and empirical analysis by Boix, 2000). Additionally, we argue that there might also exist a different *reaction* in front of an adverse shock depending on the political color of the government. That is, leftist governments probably attach a lower weight to the marginal cost of taxation, and

¹¹ As we will see later, it would be even better to dispose of information about the number of members of the coalition in order to ascertain the degree of "fragmentation" of the government, given the extreme sensibility of the empirical analysis carried out testing the effects of fragmentation on fiscal decisions (see Perotti and Kontopoulos, 2002, p. 192). However, unfortunately we do not have that information.

so in front of a negative shock in their level of tax capacity, tend to react more strongly by means of an increase in the level of tax effort than rightist governments do. On the contrary, this latter type of government might react instead by means of reductions in their level of expenditure, to which they probably confer a relatively lower weight in their objective function. The empirical results of Tavares (1999) tend to confirm this hypothesis of differential reactions. Finally, there exists mixed evidence on whether right-wing governments are less deficit-prone than left-wing ones or not (Boix, 2000; Volkerink and de Haan, 2000; and Sapir and Sekkat, 2002 find empirical evidence confirming such hypothesis, while Alesina et al., 1998, do not), and there does not seem to be any significant difference in their ability to carry out successful fiscal adjustments (Alesina and Perotti, 1995)¹². In our empirical analysis, though, we will not test the degree of success of a fiscal adjustment.

Thus, according to the traditional hypothesis of "partisan preferences" (see also Boix, 2000, for more elaborated hypothesis), we should observe a relatively greater level of public expenditure, and so a greater level of tax effort and/or higher level of debt in the case of leftist governments¹³. But we will also test the hypothesis that leftist (rightist) governments, in front of a negative shock, tend to react more (less) on the revenue side (tax effort and increases in the level of debt) than on the expenditure side. Finally, we will test whether there exists a delay in the fiscal adjustment according to the political orientation of the government, that is, whether in front of an adverse shock the volume of debt issued depends on the political color of the government.

Electoral Year vs. Non Electoral Year

During or just before the electoral year, on the one hand, we should observe a

¹² It must be taken into account that most of the empirical analysis that we are quoting have been carried out for the central government. We would expect that the influence of the political orientation were less important at the local government, since this layer of government - at least in Spain - does not usually have responsibilities on fiscal policies related with personal income distribution, neither on the expenditure side nor on the revenue side.

¹³ If we introduce the possibility of "strategic behavior" by the political parties, the basic result with respect to the issue of debt might reverse. In particular, if a rightist (leftist) party fears to lose the next electoral contest, it will issue more (less) debt in order (not) to curtail the chances of spending of the leftist (rightist) party when it reaches the government (Persson and Svensson, 1989). See Petterson-Libdom (2001) for a favorable testing of this hypothesis.

convergence of the political platforms, and the establishment of expansive policies by part of the incumbent - i.e., either an increase in the level of public expenditure, or a decrease in the level of tax effort, or a combination of both, and so, *ceteris paribus*, a relatively greater budget deficit than in any other period - in order to increase her chances of re-election (Nordhaus, 1975; Lindbeck, 1976)¹⁴. This creates the well-known *political business cycle*. On the other hand, following this approach it seems reasonable to assume that in front of an adverse shock we should observe a relatively smaller increase in tax effort and so a greater deficit in an electoral year. That is, we would expect a delay in the fiscal adjustment.

With respect to the empirical testing of the *political business cycle*, as Persson and Tabellini (2002) state, there are not conclusive results in the case of fiscal policy (see also the critical review by Drazen, 2000). According to those authors, this is mainly due to the fact that the empirical analysis have mostly focused on monetary policy and to the fact that they have not been systematic enough. In any case, they conclude that there is certain evidence on the manipulation of fiscal policy before elections. In particular, Drazen (2000) points out to the opportunistic use of fiscal transfers before the elections by part of the incumbents. Finally, with respect to the fiscal adjustment, Poterba (1994) finds for the US states that spending cuts and tax increases in front of an adverse (unexpected) shock are smaller when governors are about to stand for election¹⁵. Thus, there exists certain evidence of a delay in the fiscal adjustment in front of (unexpected) adverse shocks during the electoral period (see also Persson and Tabellini, 2002, p. 10).

Hence, during or just before the "electoral year" we should observe a common behavior of the incumbents independently of their political color, and they all should carry out expansionary fiscal policies (i.e., greater budget deficits). Finally, according to this line of reasoning, we should observe a longer delay in the process of fiscal adjustment in front of an adverse shock.

¹⁴ Even if there exist "partisan preferences", the predicted convergence in expansionary policies might occur as long as the incumbent is uncertain about her chances of re-election (Wittman, 1977), though credibility problems about the post-election period might impede the convergence of the political platforms in the case of "rational voters" (Alesina, 1988).

¹⁵ Unfortunately, we will not be able to disentangle expected from unexpected shocks, which by definition should be identified by variations in the level of permanent tax capacity (see also footnote 3).

Also related with the electoral period, there have also arisen the so-called *electoral accountability models* (the origins being Barro, 1973, and Ferejohn, 1986; see also Besley and Case, 1995), according to which the elections serve the useful proposal to account for the performance of the incumbent¹⁶. This strand of the literature predicts a lower level of "rents" in hands of the incumbent just before or during the elections, since then the incumbent aims at maximizing her chances of re-election¹⁷. As long as we interpret (part of) current expenditure as "rents" for the incumbent, we should observe a lower level of current expenditure and, as in the case of the classical "political business cycle" models, a lower level of tax effort just before or during the electoral period. With respect to the process of adjustment in front of an adverse shock, the reaction probably depends on the perception of the voters with respect to the characteristics of the shock. If they consider it is a common shock (and so it is not due to a particular bad performance of the incumbent), there should not be any difference with respect to a non-electoral year. However, if it is a specific shock (this is the situation we will deal with in our empirical analysis), it seems reasonable to postulate that the citizens will ask for a fast fiscal adjustment, mostly through a decrease again in ("wasteful") spending.

In the presence of asymmetric information about the "talent" of the incumbent, and supposing that voters aim at electing the most competent politician, the hypothesis that arises to be empirically tested is that just before or during the electoral period, public expenditure should be increased, while tax rates should be cut (Rogoff and Sibert, 1988; Rogoff, 1990). This is the so-called *signaling competence model*. Hence, this model offers the same empirical predictions than the classical analysis of the "political business cycle" (see Persson and Tabellini, 2002, p. 2). In this case, the explanation is that incurring in a deficit during or just before the electoral period it is supposed that the incumbent signals her competence in being able to (easily) rebalance the public budget after the electoral contest. Therefore, according to this hypothesis, under a negative shock in tax capacity during or before elections, we should observe a smaller decrease in public expenditure and/or a smaller increase in tax rates, and on the whole a delay in

¹⁶ Therefore, their normative implications are totally different from those on "electoral cycles".

¹⁷ The greater the value attached to the possibility of re-election in comparison with the utility that could be enjoyed from the current appropriation of "rents", the greater the expected reduction in rents.

the (unavoidable) stabilization - which is not free of economic costs- until after the elections. In this way, voters will be able to infer the competence of the politicians, who are tempted to show off their ability in managing adverse budgetary shocks.

Therefore, other two models are compatible with a singular behavior of the incumbent during the electoral year with totally different empirical predictions. The *electoral accountability model* predicts lower levels of expenditure and a faster process of fiscal adjustment, while the *signaling competence model* predicts higher levels of expenditure and a slower process of fiscal adjustment (like the "opportunistic model").

Weak vs. Strong Governments

Finally, there exists the hypothesis that the degree of fragmentation of the government will crucially affect its fiscal responsibility. Basically, two different hypotheses stand out (see Persson and Tabellini, 2000, Chapter 13). The first one deals with a "common pool" problem. As long as the government is composed by different parties (i.e., the government is a coalition of political parties), they all will share a given level of net assets (i.e., tax capacity of the municipality). However, in forming their expenditure needs, each one of the n -members of the coalition will just internalize $1/n$ of the marginal cost of its decision, while the marginal benefit will fully accrue to such group of the coalition. That is, each member of the coalition will underestimate the real cost of raising funds to carry out additional expenditure. Hence, this hypothesis predicts that independently of the state of the economy the level of public expenditure will be higher the higher the fragmentation of the government, which on average must produce greater budget deficits (Velasco, 1997)¹⁸.

The second hypothesis that arises in relation with the fragmentation of the government predicts a delay in the fiscal stabilization in front of a negative shock. In this case, though the delay embodies economic costs (among others, a higher financial cost of debt and so higher taxes in the future), each member of the coalition will attempt that the costs of the (unavoidable) fiscal stabilization fall on the other/s member/s of the coalition (i.e., the necessary increase in taxes or the necessary decrease in public

¹⁸ There exists some evidence that those periods of acute financial crisis act as catalysts of reform in the direction of reducing the budget deficits, and so they should not be feared too much (Drazen and Grilli, 1992).

expenditure). Thus, this hypothesis predicts a delay in the stabilization and so a higher level of deficit in the short run in front of an adverse shock (Alesina and Drazen, 1991)¹⁹.

Roubini and Sachs (1989) were the first authors in obtaining empirical evidence of the impact of "political fragmentation" on the level of public expenditure and public deficit. They measured fragmentation by means of a variable that reaches its maximum value for those governments in minority and the minimum one for those one-party majority parliamentary governments, and obtained significant evidence that the weaker the government (i.e., the higher the value of the qualitative variable) the greater the public deficit. Later on, Edin and Ohlsson (1991) found that the empirical results by Roubini and Sachs (1989) were just capturing the effects of minority governments. Their interpretation of that result was that "... it is harder to negotiate in parliament than within a government" (p. 1597). However, Perotti and Kontopoulos (2002) have recently cast doubt on the basic results by Roubini and Sachs (1989), since the former found that the results of the latter were due to the fact that non-majority governments exerted a lower level of taxation, while theory predicts higher levels of public expenditure (Velasco, 1997).

The empirical results checking the effects of fiscal fragmentation are quite sensitive to the measurement of fragmentation, especially when the original coding suggested by Roubini and Sachs (1989) is used. Hence, in contrast with the previous empirical results cited, de Haan and Sturm (1997) and de Haan et al. (1999) found that the type of government was not a relevant variable in explaining government debt growth or government spending levels. Both papers reached such result correcting certain mistakes of the previous empirical analysis, using another data set and trying other definitions of "political fragmentation". As we have commented before, more recently Perotti and Kontopoulos (2002) have confirmed the results by Haan and Sturm (1997) and de Haan et al. (1999). Therefore, there are not clear-cut results with respect to the effect of political weakness on the growth of public debt and public expenditure, and in any case it depends very much on how "fragmentation" is measured.

¹⁹ Balassone and Giordano (2001) also develop a bargaining model in which depending on the bargaining power of the leading member of the coalition, the deficit due to the delay in the adjustment will be more or less important.

All these empirical analysis, though, do not make a difference between the delay in the fiscal adjustment and the higher level of public expenditure due to a "common pool" problem. Nevertheless, as a main difference with all the previous papers Perotti and Kontopoulos (2002) - apart from a dummy variable indicating the degree of "political fragmentation" - have also included an interaction between their index of fragmentation and a variable identifying an adverse shock (identified by means of an increase in the unemployment rate). They expect that the greater the degree of fragmentation the greater the impact of a negative shock on the public deficit, since they argue that during "bad times" the composition of the government is expected to be more relevant. Nevertheless, we are tempted to interpret this interaction as an empirical contrast of the hypothesis of "delayed stabilization". That is, the estimate of the interaction would be picking up how a government reacts in front of a negative shock depending of its degree of political weakness. This is the approach we will follow in our empirical analysis.

On the whole, we will also test whether the degree of fragmentation of the political governments has any influence both on the level of public expenditure and on public deficit, and also on the process of fiscal adjustment in front of a negative shock. In our case, the negative shock will be identified as a fall in the level of tax capacity, while we will use a very simple measure of political fragmentation, using a dummy variable equal to one for all those parties in government that do not hold a majority of seats in the parliament (and so have to form a coalition or governing in minority) and zero otherwise.

3.3. Empirical implementation

According to the explanations given in the previous section, the basic equation to be estimated is the following:

$$\begin{aligned}
 E_{it} = & \beta_1 TC_{it} + \beta_2 CG_{it} + \beta_3 KG_{it} + \\
 & + \beta_4 Pob + \beta_5 Pob^2 + \beta_6 Pob^3 + \beta_7 Pob^4 + \beta_8 Dens + \beta_9 Inc_{it} + \\
 & + \beta_{10} E_{it-1} + F_i + T_t + \mu_{it}
 \end{aligned}
 \tag{5}$$

This basic model will be estimated for each one of the five endogenous variables (total expenditure: E ; capital expenditure: KE ; current expenditure: CE ; tax effort: TXE ; and

public deficit: DEF). In expression [5], we have used as endogenous variable total expenditure as an example. All the monetary variables are expressed in ptas. and p.c. terms. In the first row, there appear the variables picking up the flow of resources of the local government (including taxes and unconditional grants). *Tax capacity* (TC) is also expressed in ptas., and has been calculated as follows:

$$TC_{it} = \sum_{j=1}^3 \bar{t}_{j1} B_{ijt} \quad [6]$$

In order to construct the variable TC , we have considered the three main taxes in hands of the Spanish municipalities (the property tax, the tax on economic activity and the vehicles tax; see also footnote 2). Then, for example, in year t for the municipality i we have calculated for each j -tax the amount of revenue that could be collected if it applied a standard tax rate (\bar{t}_{j1}) - calculated at the beginning of the period ($t=1$), and which remains unchanged along all the years - on its tax base (B_{ijt}). Summing all these three amounts we obtain the potential tax revenue of municipality i in year t , just as expressed in [6], which by definition only depends on the level of the j -tax bases of municipality i in t . However, as it is already multiplied by a standard tax rate, it is easier to interpret how a variation in tax capacity affects the budget of the municipality²⁰.

In the second row, those variables concerning expenditure needs (Pop and $Dens$) and the preference for public good provision (Inc) are shown. Finally, in the third row, we include the lagged dependent variable in order to account for a sluggish adjustment of the endogenous variable in front of a variation in any one of the exogenous variables. For example, in front of an exogenous variation in the amount of capital grants, the short run response of total expenditure is β_3 , while in the long run (once $E_{it} = E_{it-1}$), the response is $\beta_3/(1 - \beta_{10})$. Therefore, as long as we expect costs of adjustment to the

²⁰ As we have already said in footnote 3, we do not make a difference between permanent and transitory level of tax capacity. However, as long as there were a differential reaction by part of the municipality in both cases (which would be accord with Friedman's (1957) permanent income model applied to individual consumer behavior), the estimate β_1 would be a weighted average of those two differential reactions.

new situation, $\beta_{10} > 0$. The greater the value of β_{10} , the greater the adjustment costs²¹. We have also included a set of fixed (F_i) and time effects (T_i), while μ_{it} is the standard error term of the empirical estimation.

With respect to the endogenous variables, *Tax Effort (TEX)* has been calculated as follows:

$$TEX_{it} = \sum_{j=1}^3 t_{ijt} \bar{B}_{j1} \quad [7]$$

Thus, the level of tax effort of municipality i with respect to the j -taxes in year t is calculated supposing that the municipality has the average tax base in each tax (also calculated for $t=1$). In this way, year to year changes in the level of tax effort only depend on the variation of the statutory tax rates enacted by the municipality in each one of the j -taxes. However, being multiplied by a standard tax base, it makes again easier to interpret the whole process of fiscal adjustment.

Given that current and capital transfers enter into the normal definition of public deficit, which is an endogenous variable in our model, but at the same time both types of transfers are exogenous variables (i.e., in the equation of the deficit, in principle such variables appear both on the right-hand side and left-hand side), in order to carry out the empirical analysis we have had to redefine public deficit excluding those two variables. Therefore, with respect to the equation in which deficit is the endogenous variable, we will obtain the following:

$$DEF_{it} = \beta_1 TC_{it} + \beta_2 CG_{it} + \beta_3 KG_{it} + \dots \quad [8]$$

where DEF_{it} does not include the value of the transfers. Hence, in order to obtain the normal definition of public deficit, we will have to subtract on both sides of expression [8] CG_{it} and KG_{it} , that is,

²¹ See Perotti and Kontopoulos (2002), p. 197, who stress the importance of introducing dynamics in these empirical models.

$$(DEF_{it} - CG_{it} - KG_{it}) = \beta_1 TC_{it} + (\beta_2 - 1)CG_{it} + (\beta_3 - 1)KG_{it} + \dots \quad [9]$$

Operating in this way, we get on the left-hand side of expression [9] the normal definition of public deficit. On the whole, in order to obtain the impact of current and capital transfers on the level of public deficit, we will have to subtract 1 of the estimates β_2 and β_3 , respectively.

As we justified in section 3.1., fiscal decisions of the municipality might also be influenced by the political context. Then, the basic model will be modified as follows:

$$\begin{aligned} E_{it} = & \beta_1 (TC_{it} \times D_{it}) + \beta_2 [TC_{it} \times (1 - D_{it})] + \beta_3 CG_{it} + \beta_4 KG_{it} + \\ & + \beta_5 Pob + \beta_6 Pob^2 + \beta_7 Pob^3 + \beta_8 Pob^4 + \beta_9 Dens + \beta_{10} Inc_{it} + \\ & + \beta_{11} E_{it-1} + \beta_{12} Left_{it} + \beta_{13} Weak_{it} + F_i + T_t + \mu_{it} \end{aligned} \quad [10]$$

Therefore, on the one hand, we permit a differential reaction of the municipality in front of a variation in the level of tax capacity according to its political situation. In particular, the dummy variable, D_{it} , will account for the following dichotomies: weak vs. strong governments, election year vs. non-election year, and left-wing governments vs. right-wing governments. But we will also test whether the municipality responds differently in front of a negative shock (decrease in tax capacity) than in front of a positive shock (increase in tax capacity). On the other hand, we will also permit that the political context affects the level of the budgetary variables. In particular, we have introduced a dummy for leftist governments (*Left*) and another one for those governments in minority or that govern in coalition (*Weak*); the potential effects of the electoral cycle on the level of the fiscal variables will be picked up by the time effects, although given that these will also be picking up other factors that vary year to year but equally for all the municipalities, it would be too risky to infer any conclusion from them about the fiscal impact of the electoral cycle.

The presence of the lagged endogenous variable on the right-hand side of expressions [5] and [10] makes the OLS estimator seriously biased and inconsistent, unless t tends to infinity (Nickell, 1981). The bias and inconsistency are due to the correlation of the lagged dependent variable with the individual specific effects. Given that the time period of our panel is very short, those problems must be taken into account. In order to

tackle this situation, we will use the method proposed by Arellano and Bond (1991), which is specially suitable for short dynamic panels. This method consists of, firstly, taking first differences of models [5] and [10] (so we lose one year, 1993), and, secondly, following the example of public expenditure, using E_{it} (or for $t>1$, all E_{it-1}) as an instrument(s) of the differenced-lagged dependent variable on the right-hand side.

In Table 4, there appears the Statistics Summary of all the variables that we will employ in the empirical analysis.

TABLE 4: SUMMARY STATISTICS ($T=7$; $N=104$)

	<i>Mean</i>	<i>Standard Deviation</i>	<i>Minimum</i>	<i>Maximum</i>
<i>Tax Capacity</i>	30.222,36	9.598,81	11.601,48	75.015,52
<i>Tax Effort</i>	27.186,89	4.210,70	16.916,68	41.432,42
<i>Total Expenditure</i>	90.580,98	26.332,80	33.394,09	261.735,07
<i>Current Expenditure</i>	64.306,94	14.899,68	30.626,98	128.871,07
<i>Capital Expenditure</i>	26.274,04	20.990,96	244,36	167.985,07
<i>Deficit</i>	39.147,25	43.090,07	10.636,32	129.917,33
<i>Current Grants</i>	21.617,18	4.137,92	12.346,30	37.597,48
<i>Capital Grants</i>	9.227,07	10.921,14	0	103.878,21
<i>Population (*10⁻³)</i>	22,07	42,77	0,60	268,84
<i>Density</i>	1.600,75	3.205,32	13,60	21.680,64
<i>Income</i>	1.731.281,13	260.773,83	1.101.460,76	2.865.128,27
<i>Left</i>	0,48	0,50	0	1
<i>Weak Government</i>	0,49	0,50	0	1

Note: all monetary units are expressed in p.c. terms and in ptas. of the year 1999; Source: SIEM (Diputació de Barcelona).

3.4. Empirical results

3.4.1. Basic results

The results of the empirical analysis are shown in Tables 5 to 12. Next, we describe the main results concerning each one of the estimated equations separately:

- *Public Expenditure* (Tables 5, 6 and 7): in Model 1 of Table 5, we present the results of the basic model for total expenditure (the structure is the same for all the tables). We can check that public expenditure is positively related with tax capacity. The estimate is 0,342, while for current grants, it is much greater, 0,697, though the former is not statistically significant and the latter is only significant at the 90% confidence level. Thus, there emerges certain evidence of a "flypaper effect". Neither density nor income p.c. nor population have a statistically significant impact on public expenditure p.c., while capital grants have an important positive impact, 1,062, which indicates a certain degree of co-financing (out of each 1 pta. of capital grants received by the municipality, it has to add 0,062 ptas. from its own resources for the investment project). The signs and values of all these variables are very similar in all the rest of models of Table 5, so they will not be commented again. As expected the estimate of the lagged value of the dependent variable is positive, though very small (0,099), and remains almost unchanged in all the rest of models. This suggests low costs of adjustment towards the (intertemporally) optimal level of public expenditure.

[TABLE 5]

In Model 2, we have included a dummy variable to control for "partisan preferences" (dummy equal to 1 for leftist governments), and another one to control for the effects of "political fragmentation" (dummy equal to 1 for "weak" governments), but none of them is statistically significant. In Model 3, we have tested whether the municipalities react differently in front of a positive shock than in front of a negative shock in their level of tax capacity. The estimates obtained indicate that there does not exist a statistically significant difference (later on, we will try to be more precise on this issue).

In Model 4, we allow for a differential reaction depending on the degree of "political fragmentation". In this case, we find that in front of an adverse shock in tax capacity, "strong" governments reduce their level of public expenditure up to almost fully compensating the reduction in tax revenue (0,807), while the rest of governments react much less (0,133), being only the first estimate statistically significant. Moreover, when we allow for this differential reaction, we also find that

the dummy variable that identifies “weak” governments becomes statistically significant. According to this latter variable, “weak” governments tend to expend about 17.600 ptas. p.c. more than “strong” governments. Therefore, with respect to non-majority governments, both the theory predicting a delay in stabilization and the theory predicting greater levels of expenditure are confirmed.

In Model 5, we have tested whether the reaction in front of an adverse shock is different during the electoral year. Our results certainly detect a differential reaction. In front of an adverse shock, there is a relatively more important decrease in public expenditure during the electoral period (0,709) - being statistically significant - than in any other year (0,222) - which is not statistically different from zero. Thus, it seems that governments become more accountable the closer the electoral contest. However, this result must be cautiously taken into account, since we only have two electoral contests (1995 and 1999). Thus, the robustness of this result should be checked once we dispose of more electoral periods. Finally, in Model 6, we do not detect a differential reaction according to the political color of the local government.

[TABLE 6]

[TABLE 7]

In Tables 6 and 7, we have disintegrated public expenditure between current and capital expenditure, respectively. From those estimations, we observe that local governments tend to react mainly through reductions in the level of capital expenditure (according to Model 1, 0,070 vs. 0,221, though none of these estimates is statistically significant). This suggests a relatively greater degree of flexibility of capital expenditure than current expenditure (Inman, 1995). With respect to a potentially different reaction depending on the degree of fragmentation and the closeness to the electoral year, the results obtained in the case of aggregate public expenditure are confirmed, though there is not a statistically significant difference in the case of current expenditure and the electoral year. The positive estimate of capital grants is only significant in the equation of capital expenditure. Finally, the variable population is only significant with respect to current public expenditure. The impact of this variable is non-linear, and follows the similar pattern than the one

obtained by Bosch and Solé-Ollé (2002). For low levels of population, the relationship is negative (evidence of scale-economies); once a minimum has been attained, the relationship becomes positive till reaching a maximum; from then on, the relationship tends to become null or even becomes negative again. Finally, the lagged endogenous variable is only significant in the case of capital expenditure (with a value around 0,11), suggesting the adequacy of the dynamic specification for this variable due to the costs of adjustment, which are not present in the case of current expenditure, though its estimate is positive as expected.

- *Tax Effort* (Table 8): from Model 1, we observe that tax effort negatively depends on tax capacity. Therefore, as suggested in section 3.1., this means that part of a positive shock in tax capacity is "returned" to the citizens through a reduction in tax effort. In particular, in front of an increase of 1 pta. in tax capacity, local governments return 0,25 ptas.. Nevertheless, quite in contrast with this first result, tax effort is independent of the amount of current grants. The functional relationship of tax effort with respect to population is identical to the previously one obtained in the estimated equation of current expenditure p.c. The rest of control variables do not exert a significant influence on the level of tax effort. Finally, the estimate of the lagged dependent variable (0,335) is greater than in the case of public expenditure, which indicates the difficulty in reaching immediately the long run level of tax effort after the adverse shock.

[TABLE 8]

From Model 2, we obtain certain evidence of a lower level of tax effort by “weak” governments. From the rest of models, we do not find any different statistically significant reaction according to the political situation, with the exception of Model 6. According to this, in front of an adverse shock leftist governments tend to increase taxes (0,301) much more than rightist governments do (0,182). Also once we allow for this differential reaction, we find that leftist governments also exert a relatively higher level of tax effort independently of the economic situation. Hence, the results seem to confirm the hypotheses set up in section 3.2. concerning “partisan preferences”.

- *Deficit* (Table 9): according to the results of Model 1, we observe that those governments that bear an adverse shock in tax capacity tend to increase their level of debt (0,401), though the estimate is not statistically significant. With respect to the rest of variables, only the estimates of capital and current grants are statistically significant. However, recall that these variables were originally excluded from the definition of the deficit (see expression [9]), so the value of 0,685 means that in front of an increase of 1 pta. in the amount of current transfers, the local government reduces its level of indebtedness in 0,315 ptas. (i.e., 0,685-1). In the case of capital transfers, it means that the municipality incurs in a deficit of 0,071 ptas. in front of an increase of 1 pta. in capital grants. This is due to the co-funding required by capital transfers. From Model 2, we do not observe any difference in the levels of deficit according to the political color or the degree of fragmentation of the government. As shown in Model 3, we have not found any difference in the variation in the level of debt depending on whether the government bears an adverse or positive shock in tax capacity either.

[TABLE 9]

From Model 4, we observe that “weak” governments tend to delay the stabilization in front of an adverse shock, since they increase their level of debt in 0,622 ptas. On the contrary, “strong” governments tend to adjust immediately, and so do not react incurring in a deficit (i.e., the interaction between the dummy *Strong Gvt.* and *Tax Capacity* is not statistically significant). “Weak” governments do not only tend to delay the adjustment, but they also show greater levels of deficit independently of the state of the economy. In particular, *ceteris paribus*, their deficit is 18.200 ptas. p.c. (approx.) greater than the deficit of “strong” governments. Therefore, both the theory predicting a delay in the fiscal adjustment and the theory predicting higher levels of deficit of “weak” governments have been confirmed.

There is also a difference in the reaction with respect to the accumulation of debt depending on whether the government is close or not to an electoral year (Model 5). Thus, while there is evidence of a delay in the adjustment when the electoral period is not close (the estimated increase in debt is 0,520), the fiscal adjustment is instantaneous during the electoral year (i.e., there is not an increase in the level of

debt), although as we have said before we should be cautious with respect to these results. Finally, from Model 6, we do not detect any difference in the delay of the fiscal adjustment depending on the political color of the government, nor different levels of deficit (i.e., the dummy variable “Left” is not statistically significant).

Therefore, we have shown how important is to distinguish among the municipalities according to their political situation. Otherwise, we did not find statistically significant estimates that permit us to discern the process of fiscal adjustment in front of an adverse shock (see Model 1 of each table). In fact, the key political characteristics to be taken into account are the degree of political fragmentation and the electoral period. With the exception of tax effort, only when we allow for a differential reaction according to those two political characteristics the estimates are statistically significant and it is possible to describe the process of fiscal adjustment.

In Table 10, we have redefined the dummy variable "negative shock". Instead of simply defining a "negative shock" as that situation under which the tax capacity of a municipality has fallen, a "negative shock" is identified when tax capacity has decreased a 4% (we tried lower thresholds, but then there was not a statistically significant different reaction). Once we redefine this dummy variable in this way, we obtain an asymmetric reaction in the estimated equation of tax effort. In particular, we find that the (negative) reaction is greater in absolute values in the case of a negative shock (0,276 vs. 0,263). Thus, the municipalities tend to be more responsive when they have to raise taxes than when they have to cut them.

[TABLE 10]

Finally, in Table 10 (short run responses) and Table 11 (long run responses), from the results presented in the previous tables, we show the adjustment process in front of an adverse shock of 1 pta. in tax capacity. Apart from the basic case, we have differentiated between a positive vs. a negative shock, weak vs. strong governments, election vs. non-election year, and right-wing vs. left-wing governments responses. The description of the process of adjustment loses precision in the long run, which is probably due to the short period covered by our panel.

[TABLE 11]

[TABLE 12]

4. Conclusions

In this paper, we have argued that the main unconditional grant in Spain (the so-called “Participación Municipal en los Tributos del Estado”) does not equalize tax capacity disparities among municipalities. Given this and by means of an empirical analysis carried out for a sample of municipalities of the province of Barcelona (1993-99), we have described how municipalities adjust themselves when they bear a fall in their level of tax capacity.

In front of a fall in their level of tax capacity, the municipalities react by increasing their level of tax effort, reducing their level of public expenditure and increasing their level of debt. In fact, that process of fiscal adjustment is very much influenced by the political situation of the municipality, which confirms the previous literature that stresses the importance of the political context in the process of decision making of the public sector. Thus, we have found a relative delay in the fiscal adjustment by part of those governments that govern in minority or in coalition, and a differential reaction between leftist and rightist governments such that the former type of governments tend to be relatively more responsive on the revenue side (basically, varying the level of tax effort in front of variations in the level of tax capacity).

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TABLE 5: TOTAL EXPENDITURE (N*T= 648)

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
<i>Tax Capacity</i>	0,3425 (1,199)	0,3407 (1,193)	--	--	--	--
<i>Tax Capacity * Shock (+)</i>	--	--	0,273 (0,914)	--	--	--
<i>Tax Capacity * Shock (-)</i>	--	--	0,244 (0,761)	--	--	--
<i>Tax Capacity * Strong Govt.</i>	--	--	--	0,807 (2,334)***	--	--
<i>Tax Capacity * Weak Govt.</i>	--	--	--	0,133 (0,435)	--	--
<i>Tax Capacity * Election</i>	--	--	--	--	0,709 (2,338)***	--
<i>Tax Capacity * NElection</i>	--	--	--	--	0,222 (0,774)	--
<i>Tax Capacity * Left</i>	--	--	--	--	--	0,215 (0,639)
<i>Tax Capacity * Right</i>	--	--	--	--	--	0,475 (1,347)
<i>Current Grants</i>	0,6967 (1,782)*	0,7095 (1,815)*	0,7189 (1,834)*	0,739 (1,898)*	0,541 (1,375)	0,701 (1,797)*
<i>Capital Grants</i>	1,062 (13,249)***	1,064 (13,274)***	1,069 (13,253)***	1,055 (13,183)***	1,051 (13,178)***	1,062 (13,270)***
<i>Pop</i>	836,866 (0,183)	1.055,032 (0,230)	1.288,170 (0,280)	3.697,143 (0,800)	-157,958 (-0,034)	911,517 (0,199)
<i>Pop²</i>	-15,361 (-0,196)	-24,166 (-0,306)	-26,840 (-0,338)	-45,737 (-0,577)	-1,221 (-0,015)	-24,276 (-0,308)
<i>Pop³</i>	0,096 (0,217)	0,151 (0,340)	0,163 (0,366)	0,225 (0,505)	0,034 (0,076)	0,153 (0,345)
<i>Pop⁴</i>	-0,0002 (-0,234)	-0,0003 (-0,364)	-0,0003 (-0,385)	-0,0004 (-0,470)	-0,0001 (-0,124)	-0,0003 (-0,368)
<i>Density</i>	-4,499 (-0,229)	-2,582 (-0,131)	-2,531 (-0,128)	-5,407 (-0,276)	0,509 (0,026)	-2,181 (-0,111)
<i>Income</i>	-0,004 (-0,289)	-0,004 (-0,313)	-0,004 (-0,308)	-0,003 (-0,215)	-0,005 (-0,389)	-0,004 (-0,327)
<i>Left</i>	--	1.912,165 (0,444)	1.810,38 (0,419)	1.340,353 (0,312)	1.466,052 (0,342)	9.316,317 (0,783)
<i>Weak Govt.</i>	--	-2.009,666 (-0,560)	-2.044,80 (-0,569)	17.593,206 (1,787)*	-1.463,690 (-0,409)	-2.163,062 (-0,603)
<i>T₉₅</i>	4.417,660 (1,942)*	4.390,447 (1,932)*	4.341,407 (1,906)*	4.020,602 (1,774)*	-8.989,073 (-1,965)**	4.465,003 (1,965)**
<i>T₉₆</i>	576,992 (0,226)	1.118,197 (0,420)	1.011,108 (0,377)	840,985 (0,317)	1.659,618 (0,625)	1.190,878 (0,447)
<i>T₉₇</i>	5.402,737 (1,620)	5.976,279 (1,743)*	5.911,573 (1,720)*	5.467,851 (1,601)	6.979,148 (2,039)**	6.097,320 (1,778)*
<i>T₉₈</i>	9.589,08 (1,671)*	10.184,769 (1,758)*	10.286,085 (1,773)*	9.070,391 (1,573)	11.671,849 (2,021)**	10.383,641 (1,792)*
<i>T₉₉</i>	16.409,29 (3,407)***	16.907,951 (3,474)***	17.207,836 (3,522)***	15.452,122 (3,187)***	1.987,727 (0,306)	17.117,276 (3,513)***
<i>Total Expenditure (-1)</i>	0,099 (1,993)**	0,100 (2,021)**	0,102 (2,050)**	0,101 (2,041)**	0,121 (2,441)***	0,097 (1,968)**
<i>Adj.-R²</i>	0,2670	0,2684	0,267	0,274	0,278	0,270

Note: * : 90% significant; ** : 95% significant; *** : 99% significant

TABLE 6: CURRENT EXPENDITURE (N*T= 648)

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
<i>Tax Capacity</i>	0,070 (1,144)	0,069 (1,139)	--	--	--	--
<i>Tax Capacity * Shock (+)</i>	--	--	0,047 (0,747)	--	--	--
<i>Tax Capacity * Shock (-)</i>	--	--	0,036 (0,539)	--	--	--
<i>Tax Capacity * Strong Govt.</i>	--	--	--	0,190 (2,564)***	--	--
<i>Tax Capacity * Weak Govt.</i>	--	--	--	0,016 (0,244)	--	--
<i>Tax Capacity * Election</i>	--	--	--	--	0,105 (1,591)	--
<i>Tax Capacity * NElection</i>	--	--	--	--	0,058 (0,940)	--
<i>Tax Capacity * Left</i>	--	--	--	--	--	0,083 (1,155)
<i>Tax Capacity * Right</i>	--	--	--	--	--	0,054 (0,713)
<i>Current Grants</i>	0,402 (4,791)***	0,399 (4,749)**	0,403 (4,793)***	0,408 (4,911)***	0,378 (4,388)***	0,400 (4,751)***
<i>Capital Grants</i>	0,003 (0,198)	0,004 (0,217)	0,005 (0,294)	0,001 (0,077)	0,002 (0,141)	0,004 (0,220)
<i>Pop</i>	-5.628,429 (-5,722)***	-5.735,486 (-5,814)***	-5.614,145 (-5,638)***	-5.147,013 (-5,195)***	-5.763,478 (-5,787)***	-5.712,821 (-5,771)***
<i>Pop²</i>	81,235 (4,848)***	82,922 (4,915)***	81,506 (4,810)***	76,999 (4,574)***	84,107 (4,935)***	82,846 (4,909)***
<i>Pop³</i>	-0,402 (-4,279)***	-0,413 (-4,350)***	-0,407 (-4,271)***	-0,389 (-4,124)	-0,419 (-4,375)***	-0,413 (-4,347)***
<i>Pop⁴</i>	0,001 (3,972)***	0,001 (4,050)***	0,001 (3,985)***	0,001 (3,891)***	0,001 (4,073)***	0,001 (4,047)***
<i>Density</i>	-0,221 (-0,052)	-0,029 (-0,007)	-0,037 (-0,009)	-0,455 (-0,109)	0,097 (0,023)	-0,073 (-0,017)
<i>Income</i>	0,003 (1,214)	0,003 (1,179)	0,003 (1,179)	0,004 (1,320)	0,003 (1,074)	0,003 (1,190)
<i>Left</i>	--	467,668 (0,504)	435,271 (0,470)	380,096 (0,414)	414,893 (0,444)	-373,741 (-0,146)
<i>Weak Govt.</i>	--	752,498 (0,970)	760,932 (0,982)	5.838,316 (2,808)***	837,495 (1,068)	769,266 (0,989)
<i>T₉₅</i>	2.937,084 (5,896)***	2.959,868 (5,933)***	2.940,415 (5,900)***	2.843,030 (5,754)***	1.735,103 (1,769)*	2.955,268 (5,917)***
<i>T₉₆</i>	3.798,182 (6,664)***	3.675,750 (6,143)***	3.631,857 (6,044)***	3.663,646 (6,191)***	3.667,209 (6,084)***	3.660,931 (6,095)***
<i>T₉₇</i>	6.048,272 (8,069)***	5.928,099 (7,670)***	5.892,764 (7,615)***	5.880,506 (7,694)***	5.933,445 (7,617)***	5.902,481 (7,591)***
<i>T₉₈</i>	8.962,314 (6,946)***	8.850,646 (6,772)**	8.878,958 (6,810)**	8.729,238 (6,756)***	8.839,471 (6,713)**	8.803,925 (6,690)***
<i>T₉₉</i>	11.049,16 (8,735)***	10.915,529 (8,503)***	11.016,922 (8,632)***	10.802,985 (8,510)***	9.211,091 (5,591)***	10.862,416 (8,386)***
<i>Current Expenditure (-I)</i>	0,051 (0,632)	0,058 (0,715)	0,057 (0,712)	0,034 (0,432)	0,093 (1,141)	0,061 (0,750)
<i>Adj.-R²</i>	0,103	0,102	0,103	0,120	0,092	0,100

Note: * : 90% significant; ** : 95% significant; *** : 99% significant

TABLE 7: CAPITAL EXPENDITURE (N*T= 648)

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
<i>Tax Capacity</i>	0,221 (0,798)	0,217 (0,782)	--	--	--	--
<i>Tax Capacity * Shock (+)</i>	--	--	0,165 (0,568)	--	--	--
<i>Tax Capacity * Shock (-)</i>	--	--	0,141 (0,452)	--	--	--
<i>Tax Capacity * Strong Govt.</i>	--	--	--	0,575 (1,713)*	--	--
<i>Tax Capacity * Weak Govt.</i>	--	--	--	0,059 (0,198)	--	--
<i>Tax Capacity * Election</i>	--	--	--	--	0,541 (1,836)*	--
<i>Tax Capacity * NElection</i>	--	--	--	--	0,110 (0,397)	--
<i>Tax Capacity * Left</i>	--	--	--	--	--	0,064 (0,197)
<i>Tax Capacity * Right</i>	--	--	--	--	--	0,385 (1,123)
<i>Current Grants</i>	0,300 (0,789)	0,323 (0,651)	0,330 (0,866)	0,359 (0,946)	0,217 (0,572)	0,313 (0,823)
<i>Capital Grants</i>	1,059 (13,880)***	1,062 (13,916)***	1,067 (13,852)***	1,056 (13,840)***	1,050 (13,880)***	1,061 (13,919)***
<i>Pop</i>	6.220,785 (1,337)	6.476,499 (1,392)	6.612,364 (1,417)	8.408,640 (1,801)*	5.729,031 (1,238)	6.259,625 (1,345)
<i>Pop²</i>	-92,208 (-1,178)	-102,186 (-1,300)	-103,907 (-1,318)	-117,170 (-1,487)	-85,258 (-1,091)	-101,794 (-1,297)
<i>Pop³</i>	0,470 (1,076)	0,535 (1,217)	0,543 (1,231)	0,5823 (1,323)	0,449 (1,029)	0,535 (1,217)
<i>Pop⁴</i>	-0,001 (-1,028)	-0,001 (-1,180)	-0,001 (-1,191)	-0,001 (-1,242)	-0,001 (-1,015)	-0,001 (-1,181)
<i>Density</i>	-3,569 (-0,188)	-1,685 (-0,089)	-1,503 (-0,080)	-3,607 (-0,190)	0,854 (0,045)	-1,180 (-0,062)
<i>Income</i>	-0,008 (-0,678)	-0,009 (-0,703)	-0,009 (-0,700)	-0,008 (-0,613)	-0,009 (-0,738)	-0,009 (-0,729)
<i>Left</i>	--	1.493,601 (0,358)	1.419,362 (0,340)	1.041,148 (0,250)	1.017,237 (0,246)	10.638,718 (0,923)
<i>Weak Govt.</i>	--	-3.017,416 (-0,861)	-3.066,759 (-0,873)	11.884,254 (1,240)	-2.317,140 (0,246)	-3.210,309 (-0,917)
<i>T₉₅</i>	1.487,531 (0,675)	1.434,533 (0,651)	1.387,050 (0,628)	1.113,025 (0,505)	-10.474,86 (-2,334)***	1.531,100 (0,695)
<i>T₉₆</i>	-2.998,531 (-1,216)	-2.294,975 (-0,890)	-2.387,119 (-0,921)	-2.538,803 (-0,987)	-1.888,212 (-0,738)	-2.209,900 (-0,858)
<i>T₉₇</i>	-95,112 (-0,029)	656,412 (0,197)	601,573 (0,180)	225,777 (0,068)	1.367,692 (0,413)	807,302 (0,242)
<i>T₉₈</i>	1.693,938 (0,304)	2.468,805 (0,438)	2.556,501 (0,452)	1.525,561 (0,271)	3.505,356 (0,626)	2.734,462 (0,484)
<i>T₉₉</i>	6.330,934 (1,361)	6.980,809 (1,482)	7.234,848 (1,527)	5.766,173 (1,228)	-6.415,776 (-1,018)	7.221,930 (1,532)
<i>Capital Expenditure (-1)</i>	0,109 (2,350)***	0,113 (2,417)***	0,116 (2,449)***	0,115 (2,475)***	0,117 (2,534)***	0,111 (2,377)***
<i>Adj.-R²</i>	0,264	0,265	0,263	0,267	0,280	0,267

Note: * : 90% significant; ** : 95% significant; *** : 99% significant

TABLE 8: TAX EFFORT (N*T= 648)

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
<i>Tax Capacity</i>	-0,244 (-12,761)***	-0,244 (-12,889)***	-. -	-. -	-. -	-. -
<i>Tax Capacity * Shock (+)</i>	-. -	-. -	-0,243 (-11,962)***	-. -	-. -	-. -
<i>Tax Capacity * Shock (-)</i>	-. -	-. -	-0,243 (-11,019)**	-. -	-. -	-. -
<i>Tax Capacity * Strong</i>	-. -	-. -	-. -	-0,233 (-10,048)***	-. -	-. -
<i>Tax Capacity * Weak</i>	-. -	-. -	-. -	-0,249 (-12,282)***	-. -	-. -
<i>Tax Capacity * Election</i>	-. -	-. -	-. -	-. -	-0,244 (-11,999)***	-. -
<i>Tax Capacity * NElection</i>	-. -	-. -	-. -	-. -	-0,244 (-12,897)***	-. -
<i>Tax Capacity * Left</i>	-. -	-. -	-. -	-. -	-. -	-0,301 (-14,109)***
<i>Tax Capacity * Right</i>	-. -	-. -	-. -	-. -	-. -	-0,182 (-8,197)***
<i>Current Grants</i>	0,010 (0,402)	0,013 (0,506)	0,013 (0,497)	0,014 (0,551)	0,015 (0,567)	0,009 (0,377)
<i>Capital Grants</i>	-0,002 (-0,292)	-0,002 (-0,297)	-0,002 (-0,301)	-0,002 (-0,340)	-0,002 (-0,312)	-0,002 (-0,389)
<i>Pop</i>	-1.798,127 (-5,600)***	-1.757,051 (-5,537)***	-1.757,928 (-5,521)***	-1.703,961 (-5,347)***	-1.737,970 (-5,481)***	-1.819,488 (-5,996)***
<i>Pop²</i>	27,044 (5,021)***	26,175 (4,898)***	26,181 (4,887)***	25,743 (4,805)***	26,073 (4,882)***	26,312 (5,155)***
<i>Pop³</i>	-0,120 (-3,990)***	-0,114 (-3,830)***	-0,115 (-3,822)***	-0,113 (-3,777)***	-0,114 (-3,821)***	-0,115 (-4,035)***
<i>Pop⁴</i>	0,0002 (3,283)***	0,0002 (3,096)***	0,0002 (3,091)***	0,0002 (3,064)***	0,0002 (3,089)***	0,0002 (3,274)***
<i>Density</i>	1,695 (1,299)	1,694 (1,310)	1,697 (1,310)	1,633 (1,263)	1,671 (1,298)	1,783 (1,444)
<i>Income</i>	0,0004 (0,501)	0,0004 (0,494)	0,0004 (0,487)	0,0005 (0,539)	0,0005 (0,549)	0,0003 (0,342)
<i>Left</i>	-. -	-139,883 (-0,490)	-138,028 (-0,482)	-148,942 (-0,522)	-151,596 (-0,534)	3.240,219 (4,319)***
<i>Weak Govt.</i>	-. -	-418,612 (-1,759)*	-416,054 (-1,747)*	51,955 (0,079)	-414,237 (-1,746)*	-500,074 (-2,199)**
<i>T₉₅</i>	83,454 (0,549)	79,494 (0,530)	79,930 (0,532)	70,078 (0,467)	73,057 (0,238)	122,274 (0,852)
<i>T₉₆</i>	761,584 (4,479)***	833,349 (4,751)***	834,703 (4,737)***	827,327 (4,719)***	826,944 (4,728)***	870,235 (5,189)***
<i>T₉₇</i>	1.296,012 (5,824)***	1.369,516 (6,070)***	1.370,926 (6,058)***	1.357,287 (6,020)***	1.361,026 (6,044)***	1.446,967 (6,693)***
<i>T₉₈</i>	2.037,481 (5,366)***	2.109,993 (5,574)***	2.109,320 (5,558)***	2.083,365 (5,513)***	2.090,597 (5,537)***	2.238,511 (6,168)***
<i>T₉₉</i>	2.194,459 (6,786)***	2.260,804 (7,000)***	2.255,158 (6,890)***	2.227,411 (6,900)***	2.240,482 (5,148)***	2.385,875 (7,703)***
<i>Tax Effort (-1)</i>	0,335 (5,071)***	0,319 (4,884)***	0,323 (4,730)***	0,319 (4,886)***	0,311 (4,804)***	0,273 (4,320)***
<i>Adj.-R²</i>	0,213	0,224	0,223	0,225	0,229	0,275

Note: * : 90% significant; ** : 95% significant; *** : 99% significant

TABLE 9: DEFICIT (N*T= 648)

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
<i>Tax Capacity</i>	-0,401 (-1,400)	-0,403 (-1,408)	--	--	--	--
<i>Tax Capacity * Shock (+)</i>	--	--	-0,439 (-1,462)	--	--	--
<i>Tax Capacity * Shock (-)</i>	--	--	-0,452 (-1,403)	--	--	--
<i>Tax Capacity * Strong Govt.</i>	--	--	--	0,075 (0,217)	--	--
<i>Tax Capacity * Weak Govt.</i>	--	--	--	-0,622 (-2,018)**	--	--
<i>Tax Capacity * Election</i>	--	--	--	--	-0,052 (-0,172)	--
<i>Tax Capacity * NElection</i>	--	--	--	--	-0,520 (1,819)*	--
<i>Tax Capacity * Left</i>	--	--	--	--	--	-0,418 (-1,238)
<i>Tax Capacity * Right</i>	--	--	--	--	--	-0,383 (-1,079)
<i>Current Grants</i>	0,685 (1,745)*	0,697 (1,775)*	0,700 (1,778)*	0,740 (1,889)*	0,578 (1,470)	0,697 (1,776)*
<i>Capital Grants</i>	1,071 (13,453)***	1,074 (13,479)***	1,076 (13,435)***	1,067 (13,397)***	1,060 (13,425)***	1,074 (13,480)***
<i>Pop</i>	1.036,397 (0,220)	1.165,514 (0,247)	1.268,846 (0,269)	3.690,221 (0,779)	204,973 (0,044)	1.130,450 (0,240)
<i>Pop²</i>	-27,048 (-0,339)	-35,023 (-0,436)	-36,150 (-0,449)	-54,761 (-0,680)	-13,848 (-0,173)	-34,529 (-0,430)
<i>Pop³</i>	0,153 (0,342)	0,205 (0,455)	0,209 (0,464)	0,268 (0,594)	0,095 (0,212)	0,202 (0,450)
<i>Pop⁴</i>	-0,0003 (-0,343)	-0,0004 (-0,464)	-0,0004 (-0,470)	-0,0004 (-0,545)	-0,0002 (-0,244)	-0,0004 (-0,460)
<i>Density</i>	-1,320 (-0,067)	0,810 (0,041)	0,851 (0,043)	-1,832 (-0,093)	3,723 (0,191)	0,749 (0,038)
<i>Income</i>	-0,004 (-0,312)	-0,004 (-0,336)	-0,004 (-0,330)	-0,003 (-0,234)	-0,005 (-0,373)	-0,004 (-0,349)
<i>Left</i>	--	2.311,893 (0,535)	2.252,510 (0,521)	1.726,650 (0,400)	1.763,797 (0,412)	3.351,556 (0,280)
<i>Weak Govt.</i>	--	-1.981,803 (-0,547)	-1.983,752 (-0,547)	18.193,640 (1,834)*	-1.285,625 (-0,358)	-1.978,984 (-0,546)
<i>T₉₅</i>	4.386,763 (1,926)*	4.364,426 (1,917)*	4.344,893 (1,905)*	3.962,041 (1,742)*	-8.556,134 (1,854)*	4.379,700 (1,921)*
<i>T₉₆</i>	24,613 (0,010)	596,621 (0,224)	553,789 (0,207)	293,056 (0,110)	1.029,437 (0,389)	609,756 (0,228)
<i>T₉₇</i>	4.616,459 (1,380)	5.232,076 (1,518)	5.215,493 (1,510)	4.720,146 (1,373)	6.029,191 (1,760)*	5.256,900 (1,523)
<i>T₉₈</i>	8.440,112 (1,466)	9.088,790 (1,560)	9.145,947 (1,569)	7.950,161 (1,369)	10.251,568 (1,772)*	9.150,281 (1,568)
<i>T₉₉</i>	15.377,00 (3,198)***	15.935,305 (3,274)***	16.098,521 (3,292)***	14.411,383 (2,969)***	1.389,104 (0,214)	15.973,677 (3,274)***
<i>Deficit (-1)</i>	0,106 (2,166)**	0,109 (2,211)**	0,110 (2,218)**	0,114 (2,325)**	0,119 (2,428)***	0,108 (2,194)**
<i>Adj.-R²</i>	0,263	0,264	0,263	0,267	0,278	0,264

Note: * : 90% significant; ** : 95% significant; *** : 99% significant

TABLE 10: FURTHER EVIDENCE ON ASYMMETRIC REACTIONS (N*T= 648)

	<i>Total Expenditure</i>	<i>Current Expenditure</i>	<i>Capital Expenditure</i>	<i>Tax Effort</i>	<i>Deficit</i>
<i>Tax Capacity * Shock (+)</i>	0,300 (1,022)	0,049 (0,784)	0,199 (0,696)	-0,263 (-13,711)***	-0,396 (-1,343)
<i>Tax Capacity * Shock (-)</i>	0,279 (0,856)	0,037 (0,536)	0,179 (0,566)	-0,276 (-12,876)***	-0,386 (-1,180)
<i>Current Grants</i>	0,706 (1,807)*	0,399 (4,751)***	0,327 (0,860)	0,013 (0,499)	0,694 (1,769)*
<i>Capital Grants</i>	1,065 (13,283)***	0,003 (0,205)	1,062 (13,911)***	-0,002 (-0,375)	1,074 (13,482)***
<i>Pop</i>	1.144,434 (0,250)	-5.708,419 (-5,785)***	6.493,245 (1,395)	-1.721,532 (-5,579)***	1.158,421 (0,246)
<i>Pop²</i>	-24,146 (-0,305)	83,225 (4,945)***	-101,503 (-1,290)	26,529 (5,099)***	-35,400 (-0,441)
<i>Pop³</i>	0,149 (0,336)	-0,416 (-4,389)***	0,530 (1,204)	-0,118 (-4,040)***	0,207 (0,460)
<i>Pop⁴</i>	-0,0003 (-0,358)	0,001 (4,090)***	-0,001 (-1,167)	0,0002 (3,303)***	-0,0004 (-0,469)
<i>Density</i>	-2,830 (-0,144)	-0,117 (-0,028)	-1,725 (-0,091)	1,566 (1,244)	0,823 (0,042)
<i>Income</i>	-0,004 (-0,318)	0,003 (1,172)	-0,009 (-0,714)	0,0004 (0,464)	-0,004 (-0,330)
<i>Left</i>	1.898,882 (0,440)	461,790 (0,499)	1.498,223 (0,359)	-147,142 (-0,530)	2.308,576 (0,534)
<i>Weak Govt.</i>	-2.025,767 (-0,563)	742,322 (0,958)	-3.061,558 (-0,872)	-428,490 (-1,850)*	-1.960,22 (-0,541)
<i>T₉₅</i>	4.401,866 (1,937)*	2.958,053 (5,942)***	1.426,904 (0,647)	88,427 (0,606)	4.368,680 (1,919)*
<i>T₉₆</i>	1.128,855 (0,423)	3.692,163 (6,187)***	-2.318,126 (-0,899)	833,446 (4,885)***	611,189 (0,229)
<i>T₉₇</i>	6.048,027 (1,766)*	5.976,819 (7,777)***	652,691 (0,196)	1.397,127 (6,371)***	5.243,094 (1,523)
<i>T₉₈</i>	10.347,334 (1,784)*	8.964,750 (6,898)***	2.542,585 (0,450)	2.191,498 (5,945)***	9.062,656 (1,555)
<i>T₉₉</i>	17.144,524 (5,515)***	11.091,342 (8,739)***	7.083,028 (1,499)	2.395,038 (7,561)***	15.896,41 (3,256)***
<i>Endogenous variable (-1)</i>	0,100 (2,023)**	0,052 (0,648)	0,114 (2,428)***	0,283 (4,297)***	0,109 (2,207)**
<i>Adj.-R²</i>	0,268	0,105	0,265	0,545	0,264

Note: *: 90% significant; **: 95% significant; ***: 99% significant

TABLE 11: SHORT RUN RESPONSES IN FRONT OF A DECREASE IN TAX CAPACITY

	∇ (Current Expenditure)	∇ (Capital Expenditure)	∇ (Tax Capacity)	Δ (Tax Effort)	Δ (Deficit)
Basic case	-0,070	-0,221	-1	0,244 ^{***}	+0,401
	-0,342			-0,355	
Shock (+)	+0,047	+0,165	+1	-0,243 ^{***}	-0,439
	0,273			0,318	
Shock (-)	-0,036	-0,141	-1	0,243 ^{***}	+0,452
	-0,244			-0,305	
Strong Govt.	-0,190 ^{***}	-0,575 [*]	-1	+0,233 ^{***}	-0,075
	-0,807 ^{***}			-0,842	
Weak Govt.	-0,016	-0,059	-1	+0,249 ^{***}	+0,622 ^{**}
	-0,133			-0,129	
Election Year	-0,105	-0,541 [*]	-1	+0,244 ^{***}	+0,052
	-0,709 ^{***}			-0,704	
No Elect. Year	-0,058	-0,110	-1	+0,244 ^{***}	+0,520 [*]
	-0,222			-0,236	
Right	-0,054	-0,385	-1	+0,182 ^{***}	+0,383
	-0,475			-0,435	
Left	-0,083	-0,064	-1	+0,301 ^{***}	+0,418
	-0,215			-0,281	

TABLE 12: LONG RUN RESPONSES IN FRONT OF A DECREASE IN TAX CAPACITY

	∇ (Current Expenditure)	∇ (Capital Expenditure)	∇ (Tax Capacity)	Δ (Tax Effort)	Δ (Deficit)
Basic case	-0,074	-0,248	-1	+0,367 ^{***}	+0,449
	-0,380			-0,134	
Shock (+)	+0,050	+0,187	+1	-0,359 ^{***}	-0,493
	0,304			0,148	
Shock (-)	-0,038	-0,160	-1	+0,359 ^{***}	+0,508
	-0,272			-0,133	
Strong Govt.	-0,197 ^{***}	-0,650 [*]	-1	+0,342 ^{***}	+0,085
	-0,898 ^{***}			-0,573	
Weak Govt.	-0,017	-0,067	-1	+0,366 ^{***}	+0,702 ^{**}
	-0,148			0,068	
Election Year	-0,116	-0,613 [*]	-1	+0,354 ^{***}	+0,059
	-0,807 ^{***}			-0,587	
No Elect. Year	-0,064	-0,125	-1	+0,354 ^{***}	+0,590 [*]
	-0,253			-0,056	
Right	-0,057	-0,433	-1	+0,250 ^{***}	+0,429
	-0,526			-0,321	
Left	-0,088	-0,072	-1	+0,414 ^{***}	+0,469
	-0,238			-0,117	